

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE



TAMURA

Atty. Ref.: 330-231

Serial No. 09/766,318

Group: 1774

Filed: January 19, 2001

Examiner: Ferguson

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For: HEAT-RESISTANT GLASS FIBER AND PROCESS FOR THE PRODUCTION THEREOF

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March 18, 2003

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

RESPONSE AFTER FINAL REJECTION AND PRESENTATION OF EVIDENCE

This is responsive to the Official Action of November 4, 2002, Paper No. 9. Petition is hereby made for a two month extension of time for which our check in the appropriate amount is attached. Claims 1-5 remain pending and active in the application.

Attached is the Declaration of Mr. Tamura, the inventor, made March 14, 2003, which was prepared following discussions with the examiner and the undersigned on January 16, 2003.

In his Declaration Mr. Tamura confirms the correctness of the working examples and comparative examples included in the specification as filed, including recognition that the procedures in Examples 1-5 are typical examples of the present invention whereas comparative Example 3 is a typical example of the disclosures of U.S. 5,789,329 to Eastes et al.

The issues raised in the outstanding Official Action relate to the pertinence of the Eastes et al reference cited by itself against claims 1-3 or in combination with the

secondary document against claims 4 and 5. It is applicant's position the claims now under review define subject matter that is patentable over the disclosures of the documents cited as evidenced by the information contained in the attached Declaration, which includes the examples and comparative examples in the as-filed specification as well as additional examples demonstrating the criticality of the SiO₂ content.

The evidence in Mr. Tamura's Declaration shows in all of Examples 1 to 5 (according to the present invention) the ΔT is at least 50°C so that the glasses are excellent in spinnability, and further, the glass fibers are excellent in acid treatment properties and have 0.60 to 0.98 μm thick surface layer portions made of silicic glass (having an SiO₂ content of at least 90% by weight), so that they have excellent heat resistance.

By contrast, in Comparative Example 3 (from the Eastes et al reference), the glass has a high SiO₂ content and is excellent in spinnability. However, the glass fiber is poor in acid treatment properties, and since the surface layer portion made of a silicic glass has a thickness of only 0.04 μm , the glass fiber is very poor in heat resistance.

These results demonstrate technical significance and criticality in the numerical restriction of the upper limit of SiO₂ to 58.5 wt% in the present invention.

For further confirmation of the technical significance of numerical limitation of the upper limit of SiO₂ to 58.5 wt%, the inventor carried out a series of six experiments in which the content of SiO₂ was changed to 56, 57, 58, 58.5, 59 and 60 wt%, the content of CaO, whose content was the second largest, was changed to 26, 25, 24, 23.5, 23 and 22 wt% and the contents of the other components Al₂O₃, MgO, Na₂O and K₂O were kept unchanged.

The inventor reports in his Declaration on the data in Table 3 when the SiO₂ content is 56 wt%, the weight loss ratio after the acid treatment is 12 wt%, and the glass fiber has remarkably excellent acid treatment properties. When the SiO₂ content is increased to 57 wt%, 58 wt% and 58.5 wt%, the weight loss ratio decreases but is 8.00 wt%, 3.00 wt% or 1.70 wt%. The glass fibers therefore have excellent acid treatment properties.

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However, when the content of SiO_2 exceeds 58.5 wt% and reaches 59 wt% a significant change happens, the weight loss ratio becomes smaller than 1 wt% and is 0.30 wt%, which value corresponds to 17.6% of the weight loss ratio (1.70 wt%) obtained when the content of SiO_2 is 58.5%. Further, the weight loss ratio when the content of SiO_2 is 60% corresponds to 5% of the weight loss ratio when the content of SiO_2 is 58.5 wt%. The inventor concludes these results show that the SiO_2 content of 58.5 wt% has technical significance.

It will be apparent from all of the data contained in the attached Evidentiary Declaration, applicant's claims define heat-resistant glass fibers having properties distinct from and patentable over the disclosures of the compositions defined in the applied Eastes et al reference. Accordingly, claims 1-3 are patentable and so too are claims 4 and 5 by virtue of their dependence from claim 1. Reconsideration, entry of this Amendment and evidence and allowance are solicited.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: _____



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